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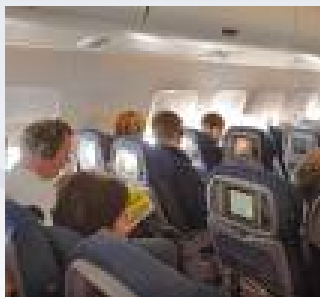
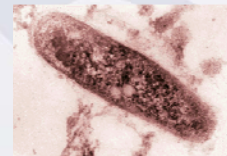
Public Health  
Agency of Canada

Agence de la santé  
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Canada

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## TB and Air Travel



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Great Lakes Border Health  
Initiative  
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MPG

KM/L

THE CHRISTIAN SCIENCE MONITOR *Bennett*



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## Outline

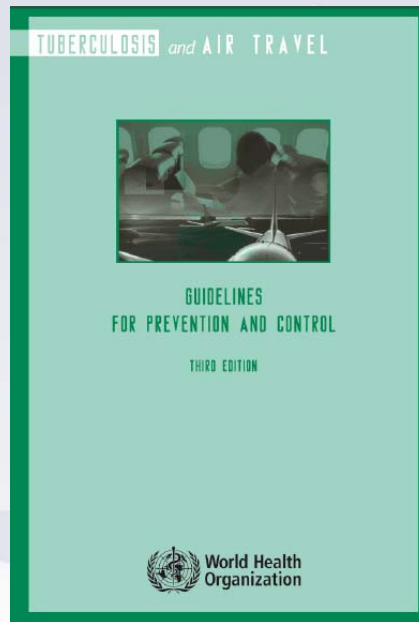
- Transmission of TB on airline flights
- WHO TB and Air Travel Guidelines
- The Canadian experience
- Challenges, partnerships and collaboration

## TB Transmission on Airlines - 101

- Potential but low risk - flights of 8 hours or longer
- **Agent** – aerosolized *M. tuberculosis*
- **Host** – passengers (and crew?)
- **Environment** – aircraft cabin

## Agent

- Aerosolized TB bacteria from infectious case
  - Smear and culture status
  - Treatment status
  - Cavitory lesions on x-ray
  - Symptoms
  - Site of disease
  - Documented transmission



## Agent – WHO Guidelines

- Infectious
- Potentially infectious
- Non-infectious
  - MDR/XDR need two negative cultures

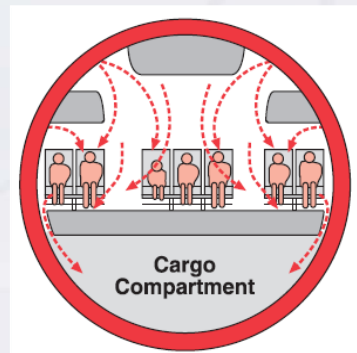
## Hosts

- Proximity to the index case
  - Passengers near by
  - Crew (no longer contacts)
- Five rows (usually)
  - Case's row
  - Two rows ahead of case
  - Two rows behind case
- (Susceptibility)



## Environment

- Duration of exposure
- Cabin air quality
  - Down and to the side walls
  - ~20 air exchanges per hour
  - High-efficiency particulate air (HEPA) filters
  - No increased risk of transmission







## The Canadian Experience





## Canadian Guidelines

- Follow-up regardless of time from flight to notification
- Follow-up regardless of flight duration if MDR or laryngeal TB
- Definition of non-infectious

## Investigation Process

- Diagnosis, travel history
- Reporting form
- Review and risk assessment

**Public Health Agency of Canada / Agence de la santé publique du Canada**

Return completed form to your provincial/territorial TB control program.  
Retourner le formulaire dûment rempli à votre programme provincial ou territorial de lutte antituberculeuse.

**Reporting Form for a Case of Infectious Tuberculosis on an Aircraft**  
**Formulaire de déclaration d'un cas de tuberculose infectieuse à bord d'un avion**

1. FLIGHT INFORMATION / RENSEIGNEMENTS SUR LE VOL						
Date of flight / Date du vol	Airline / Ligne aérienne	Flight No. / N° du vol	Origin / Origine	Destination	Seat / Siège	Flight duration* / Durée du vol**
1.						Yes / Oui
2.						Yes / Oui
3.						Yes / Oui
4.						Yes / Oui

\* Duration includes ground delays before and after flight. \*\* La durée inclut les délais au sol avant et après le vol.  
\*\* Active during flight: cabin, vehicle other passengers, vehicle luggage, etc. / \*Active pendant le vol: Salles d'attente, à bord du vol, à l'arrêt d'autres passagers, à l'arrêt du vol, etc.

2. CASE INFORMATION / RENSEIGNEMENTS SUR LE CAS			
Last name / Nom de famille	First name / Prénom	Sex / Sexe	
Date of birth / Date de naissance	Country of birth / Pays de naissance	Age / Âge	
Country of permanent residence / Pays de résidence permanente	Current immigration status / Statut d'immigration actuel	Category of citizenship / Catégorie de citoyenneté	

3. TESTS, MEDICAL HISTORY, AND OTHER INFORMATION / RENSEIGNEMENTS MÉDICAUX ET AUTRES			
Date of symptom onset / Date d'apparition des symptômes	Date of diagnosis / Date du diagnostic	Date of symptom onset / Date d'apparition des symptômes	Date of diagnosis / Date du diagnostic
Direct molecular detection result / Résultat de la détection moléculaire directe	Direct molecular detection result / Résultat de la détection moléculaire directe	Direct molecular detection result / Résultat de la détection moléculaire directe	Direct molecular detection result / Résultat de la détection moléculaire directe
Culture result / Résultat de la culture	Culture result / Résultat de la culture	Culture result / Résultat de la culture	Culture result / Résultat de la culture
Sensitivity results / Résultats des analyses de sensibilité	Sensitivity results / Résultats des analyses de sensibilité	Sensitivity results / Résultats des analyses de sensibilité	Sensitivity results / Résultats des analyses de sensibilité
INH	INH	INH	INH
RIF	RIF	RIF	RIF
EMB	EMB	EMB	EMB
FLU	FLU	FLU	FLU
Other (specify) / Autres (spécifier)	Other (specify) / Autres (spécifier)	Other (specify) / Autres (spécifier)	Other (specify) / Autres (spécifier)
Cough during flight? / Toux pendant le vol?	Cough during flight? / Toux pendant le vol?	Cough during flight? / Toux pendant le vol?	Cough during flight? / Toux pendant le vol?
Yes / Oui	Yes / Oui	Yes / Oui	Yes / Oui
No / Non	No / Non	No / Non	No / Non
Unknown / Inconnu	Unknown / Inconnu	Unknown / Inconnu	Unknown / Inconnu
Any relevant officials (such as CBSA, CIC, RCMP) contacted about this case? / Est-ce que les agents fédéraux (ASFC, CIC, GRC) ont été contactés au sujet de ce cas?	Any relevant officials (such as CBSA, CIC, RCMP) contacted about this case? / Est-ce que les agents fédéraux (ASFC, CIC, GRC) ont été contactés au sujet de ce cas?	Any relevant officials (such as CBSA, CIC, RCMP) contacted about this case? / Est-ce que les agents fédéraux (ASFC, CIC, GRC) ont été contactés au sujet de ce cas?	Any relevant officials (such as CBSA, CIC, RCMP) contacted about this case? / Est-ce que les agents fédéraux (ASFC, CIC, GRC) ont été contactés au sujet de ce cas?
Yes / Oui	Yes / Oui	Yes / Oui	Yes / Oui
No / Non	No / Non	No / Non	No / Non
Unknown / Inconnu	Unknown / Inconnu	Unknown / Inconnu	Unknown / Inconnu

4. REPORTING INFORMATION / RENSEIGNEMENTS SUR LA DÉCLARATION			
Form completed by / Formulaire rempli par	Phone / Téléphone	Province/Territory / Province ou territoire	
Date completed / Date de remplissage	Date completed / Date de remplissage	Date completed / Date de remplissage	Date completed / Date de remplissage

PHAC/ALPC 03-0008

- Flight info
- Case information
- Infectiousness
- Drug Sensitivities
- Flight Risk

## Investigation Process

- Notification
  - Quarantine (PHAC), airline
  - International partners - determine roles
- Obtain necessary contact information
  - Manifest, PNRs, frequent flyer info, customs declaration cards, passports
- Notifications of jurisdictions regarding passenger contacts
- Obtain results of contact assessments if available

## Canadian Experience

- Summary of files 2006 to 2007
- 53 cases of TB
  - Male, foreign-born, median 45 years old
  - Most moderately to highly infectious ( $\geq$  AFB 3+ and cavitory)
- Three drug-resistant (two MDR)
- Number of notifications increasing

## Challenges

## Challenges to Investigation

- Diagnosing country and country of flight arrival are different

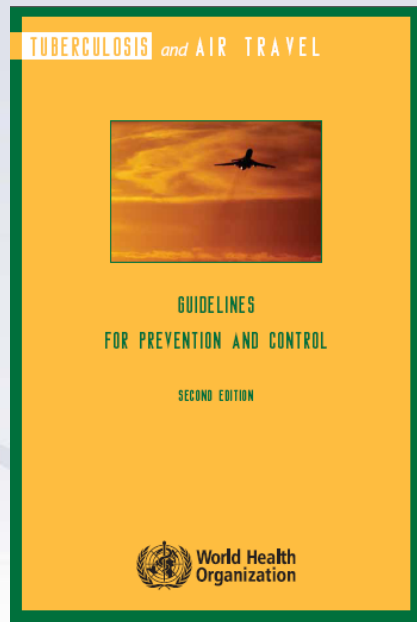
Example:



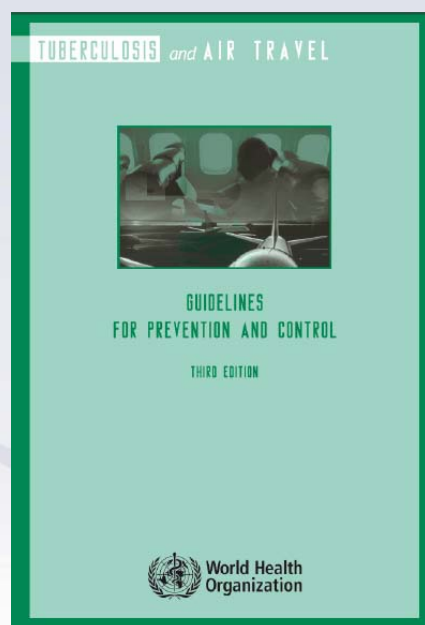
- More than one country of destination for at-risk flights

## Challenges to Investigation

- Airline not based in country of diagnosis
- One country involved has national guidelines that differ from WHO or another country
  - More stringent than WHO
  - Procedures differ



- Criteria for follow-up unclear
- Lacked guidance on collaboration responsibilities



- Clarifies threshold criteria for follow-up
- Clarifies roles, responsibilities and process of collaboration
- Stipulate that national guidelines be used where available

## Other issues

- Preventing travel by infectious persons
  - Prevent travel before it happens!
  - If case is abroad, ensure assessment and treatment before return travel
- Suspect cases
- Waiting for culture and drug sensitivities
- Need for rapid communication of information

## Partners and Collaboration

- Local, provincial/state public health
- Quarantine Services, PHAC
- Airlines
- Canadian Border Services Agency
- Passport Office – Foreign Affairs
- CDC Quarantine Service
- International TB Programs

## Chuckle Bros



"I'm sorry, sir, but it says here  
you're on the 'No Fly' list."

## Conclusions

- Small but potential risk of transmission
- Updated WHO guidelines provide clarification
- Collaboration between partners including local, provincial, federal and international jurisdictions is critical
- Number (and complexity) of investigations to increase





[www.publichealth.gc.ca/tuberculosis](http://www.publichealth.gc.ca/tuberculosis)

[www.santepublique.gc.ca/tuberculose](http://www.santepublique.gc.ca/tuberculose)